

NOTES ON FILE TRANSFERS BETWEEN MICROPOLIS MDOS OR CP/M AND 8" CP/M

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I recently purchased a used Micropolis MOD-II Floppy Disk Subsystem (controller and 1053 dual disk drive module) as a backup for a hybrid S-100 bus system, having MOD-II drives and MDOS and CP/M 1.4 operating systems, that has been used since 1978 to control an apparatus for research in atomic physics. The new disk system was installed on another S-100 bus computer in my laboratory so that software could be developed, and interfaces could be tested, without interrupting the atomic physics experiments. The second computer uses 8" SS/DD drives and a Geo. Morrow Assoc. DJ-2D controller with CP/M 2.2.

The Problem

How can I transfer programs or data files between operating systems (MDOS and CP/M) and between disk system formats? The ideal solution, at least for CP/M-to-CP/M, may be to write a CP/M BIOS that can handle both controllers simultaneously. But, for various reasons, this may not be an option for everyone. The MDOS-to-CP/M transfer is another matter, in any case. My solution to this problem is outlined below. It doesn't require sophistication in system programming, but it does require a little familiarity with DDT, the memory layout of the system, and the 8080 or Z80 instruction set. It is also necessary to have a monitor program in EPROM such as Zapple, the Vector or SOL monitors, etc.

First, you must have the two disk controller cards simultaneously plugged into the S-100 bus and addressed so that the memory regions used by their boot PROMs do not overlap. Then a jump to either boot PROM will bring up the appropriate disk system.

CP/M on Micropolis to 8" CP/M Transfers

The trick here is to have two complete non-overlapping CP/M systems resident in RAM at once and to change the BDOS and BIOS vectors in page 0 to jump between the two. My monitor, Zapple, is located at F000h, the Micropolis boot address is E800h, and the Morrow boot is at E000h. Both CP/Ms must lie below that. DDT will be used by the system that has the source file to be transferred, and this system will lie lower in memory.

First I used the Morrow CP/M to construct a 55K system (this leaves 1K below E000h for Zapple's stack). This was SYSGEN'd onto an 8" disk. Then I determined that the 55K system extended down to B900h (46-1/4 K). So I used CP/M on Micropolis to construct a system that extended only up to B400h (45K). For my Lifeboat Assoc. CP/M 1.411, this was a nominal 43K system. This was SYSGEN'd onto a 5" disk.

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Next I found the BDOS and BIOS vectors for each system as follows. I booted up on the 55K 8" system and then hit 'reset' to jump to Zapple. By examining the first 8 locations in memory (starting from 0h) I found the following hex code: C3 03 CF 00 00 C3 06 C1. I reconstructed this to be (at 0h) a jump to BIOS warmstart at CF03h and (at 5h) a jump to BDOS at C106h. Note that you must determine these vectors without loading DDT, because the BDOS vector is changed when DDT is loaded.

Likewise, I booted up on the 43K Micropolis 5" system and found the BIOS and BDOS vectors in those same locations to be AA03h and 9D06h respectively. With this information, I had two options: write some very short machine-code programs to change the vectors automatically, or change the vectors "by hand" for every file transfer. I chose a little of each. Since the vectors I found probably won't be the same as anyone else's, the programs below will have to be changed appropriately in other cases.

DDT on Morrow CP/M was used to create M43.COM (Zilog mnemonics, but it's all 8080 code):

```
0100    21 01 00      LD HL,0001h
        3E 03        LD A,03h
        77          LD (HL),A
        23          INC HL
        3E AA (or CF) LD A,0AAh (or 0CFh)
        77          LD (HL),A
        21 06 00      LD HL,0006h
        3E 06        LD A,06h
        77          LD (HL),A
        23          INC HL
        3E 9D (or C1) LD A,9Dh (or 0C1h)
        77          LD (HL),A
        C3 00 00      JP 0000h
```

This code was entered from the keyboard at 0100h by using the S command, or you could do it with the A command if you use Intel mnemonics. Then it was SAVE'd from CP/M on the 8" disk with the command:

```
A>SAVE 1 M43.COM
```

The function of M43.COM is to change the vectors to point to the Micropolis 43K system and then warm-boot it. The code alternatives given above were used to create M55.COM by DDT on Micropolis CP/M and were saved on the 5" disk as M55.COM. The function of M55.COM is to change the vectors to point to the Morrow system and then warm-boot it.

Now I can boot up on both systems and pass between them as follows:

```
(Reset) (Jumps to Zapple.)
>GE000  (Zaple command to jump to 8" boot PROM.)
        (Now Morrow 8" CP/M signs on.)
(Reset) (Jumps to Zapple again.)
```

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>GE800 (Zapple command to jump to Micropolis boot.)
(Now Micropolis 5" CP/M signs on.)

At this stage you have both CP/Ms in memory at once. Note that you have to know the boot location for each disk controller. Actually, I have single-keystroke Zapple commands to boot either system from the monitor. From this point you can pass back and forth between systems by entering the commands:

A>M55 (Micropolis to Morrow)

A>M43 (Morrow to Micropolis)

This doesn't mean you can transfer files yet, but it is a first step toward using both systems. It is helpful to have another simple command file, MICROP.COM, whose purpose is to cold-boot the Micropolis from Morrow's CP/M prompt without going to the monitor:

0100 C3 00 E8 JP 0E800h

Now we are ready to transfer a file from Micropolis to Morrow.

```
(Reset)
(Boot Morrow 55K)
A>MICROP (This cold-boots Micropolis.)
A>DDT source.fil (Loads CP/M source file at 0100h.)
                (Note NEXT to get file size.)

-S0
0000 C3
0001 03
0002 AA CF (This fixes BIOS vector to point to Morrow.)
0003 01
0004 00
0005 C3
0006 00 06 (This fixes BDOS vector, disturbed by loading
0007 8D C1 DDT, to point to Morrow.)
0008 00 .
-G0 (Warm-boots Morrow.)
A>SAVE nn destin.fil (nn calculated from NEXT)
A>MICROP (Cold-boots Micropolis)
        (continue as needed to transfer further files.)
```

8" CP/M to CP/M on Micropolis Transfers

The procedure here is basically the same, but now you need to construct two more CP/M systems so that Morrow will lie in lower memory than Micropolis. For me, that was Micropolis 53K system and Morrow 47K system. A file MORROW.COM was created and SAVE'd on the 5" disk to cold-boot Morrow from Micropolis's CP/M prompt:

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0100 C3 00 E0 JP 0E000h

The BIOS and BDOS vectors were found for the Micropolis 53K system as described above or just by adding 2800h (10K) to the 43K vectors found previously. Now we do the transfer as follows:

```
(Reset)
(Boot Micropolis 53K)
A>MORROW (This cold-boots Morrow 47K)
A>DDT source.fil (Loads CP/M source file at 0100h.)
                (Note NEXT to get file size.)

-S0
0000 C3
0001 03
0002 AF D2 (This fixes BIOS vector to point to
0003 00 01 Micropolis.)
0004 00
0005 C3
0006 00 06 (This fixes BDOS vector, disturbed
0007 91 C5 by loading DDT, to point to Micropolis.)
0008 00 .

-G0 (Warm-boots Micropolis.)
A>SAVE nn destin.fil (nn calculated from NEXT)
A>MORROW (Cold-boots Morrow)
        (Continue as needed to transfer further files.)
```

Note that the CP/M system sizes had to be reversed depending on which direction the file transfer was to proceed, because loading DDT from the higher system puts it just below CP/M, which would overwrite the lower system in RAM. Yet DDT must be loaded by the system that is the source end of the transfer in order to bring the source.fil off the disk.

File transfers can be made with this technique for any files, data or programs or text or object code, as long as they will fit between 0100h and the somewhat-lower-than-usual DDT. Larger files can perhaps be broken up, but I haven't tried this.

Transfer of Files From MDOS to 8" CP/M

This transfer is ok for absolute data, object code, and ASCII text files (e.g. Wordstar files), but Micropolis BASIC programs and LINEDIT files are another thing. Formats, tokenization, etc., are different. This transfer assumes you have a working MDOS 4.0, which loads in low memory, and an 8" CP/M, which loads in high memory.

```
(Boot Morrow)
A>MICROP (Boots MDOS.)
>LOAD "source" 3000
>EXEC 0 (Warm-boots Morrow.)
```

```
A>DDT
-M3000 mmmm 0100      (Moves code down to CP/M save location.
                       You have to know how big the source is to determine
                       mmmm.)
-<cntl>C              (Exit DDT.)
A>SAVE nn destin.file (Figure out how much to save from mmmm.)
A>MICROP              (Repeat as needed.)
```

This works because MDOS doesn't use 0h-FFh and extends, in my version, only up to 2AFFh. Also the top of DDT, when loaded with no file, is 139Fh, so although this overwrites MDOS, which is no longer needed after the MDOS file is brought off the 5" disk, it doesn't interfere with the data loaded at 3000h. You could have some problems with large files, if the data won't fit between 3000h and the bottom of CP/M.

Transfer of Files From 8" CP/M to MDOS

We assume that the data block or absolute code to be transferred exists in a file on the 8" CP/M disk: SOURCE.DAT for example.

```
(Boot Morrow)
A>DDT SOURCE.DAT
-M100 nnnn 3000      (nnnn is the end of SOURCE.DAT, as indicated
                     by the NEXT after DDT loads. If NEXT is
                     greater than 3000h, you can move the data
                     farther to avoid an overlapping move. Then,
                     below, it should be SAVE'd from the appropriate
                     location by MDOS.)

A>MICROP              (Boot MDOS.)
>SAVE "SOURCE.DAT" 3000 mmmm 0
                     (mmmm is the end of the moved data in the
                     earlier step. File type is 0, or it could
                     be anything.)

>EXEC 0              (Warm-boots Morrow. Repeat as necessary.)
```

Then if the data block is to be loaded in MDOS, use:

```
>LOAD "SOURCE.DAT" 3000
```

or whatever other load address you like.

These procedures require a little fiddling, but they don't require much sophistication or rewriting BIOS's or use of assemblers. Clearly the procedures are adaptable to transfer between Micropolis and any other 5" or 8" controllers running CP/M, not just the DJ-2D, provided they boot from a jump to some memory location.

One could perhaps automate some of the steps in these file transfers. For CP/M-to-CP/M transfers, one could allow for the size of DDT when deciding what CP/M system sizes to use, so that each system could have its own DDT at the

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same time. Then transfers could go in either direction without using two different sets of systems. I hope the above will find some use.

If anyone knows a source for a CP/M version that will handle my Morrow 8" disk controller and Micropolis MOD-II 5" controller at the same time, please write or phone.

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CLASSIFIED

FOR SALE: Vector 3 with Micropolis Dual Disk Drive. Excellent working order. Includes Peachtree A/R, A/P, Inv. Mgmt., Payroll, G/L, Execuplan, CP/M games, MDOS games, Data Manager and Communications package. \$1,200. If interested, call Kathy Dufur (816) 454-3898, collect. 4655 N. Gladstone, Kansas City MO 64117.

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FOR SALE: Two Micropolis 1042 MOD I disk drives with the S-100 controller card. This equipment was only used for personal use in my home system. I'll throw in over 100 SSDD 16-sector disks, all for \$150. Richard Rusczyk, (813) 321-0275, after 5 PM EST.

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FOR SALE: Two Vector 440 computers (10 Mbyte hard disk). One purchased in Jan. 1984 and operating on CP/M-86. One purchased in Jan. 1983 and includes CP/M-86 and MSDOS. Also have one Nec-7700 printer, Data Manager, Execuplan, Memorite, Accuchart, Connect, and Basic. Price for one computer, printer, and program packages is \$2875. If a computer is sold alone, price is \$2500. Tony Delp, (316) 549-3273, Computer Business Service, Box 174-A, St. John KS 67576.

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FOR SALE: S-100 Cromemco CPU, 64K, Cromemco TU-ART I/O, Micropolis 1053-II (dual drives), MDOS 4.0, CP/M 2.2. No terminal or printer. \$600. Greg Gonda, (217) 352-3207, days.

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FOR SALE: Vector Graphic System 5032E. Contains 8-bit, 6 Mhz, Z-80B CPU, using Extended (128K) Multi-user CP/M. Has double-sided quad-density 5 1/4" 16-hard-sector floppy disk drive and a 33.6 megabyte (formatted) Winchester hard disk, three Mindless Terminals connected via two 50 ft cables and one 15 ft cable, Safstor Cartridge tape backup (17 Megabyte, unformatted, per 450 ft tape), NEC 7700Q printer with tractor feed. System also includes Sola model 63-13-210 power regulator, TI POP powerline outlet protector, printer sound insulation hood, and CRT mobile stand. The software includes Accounting (G/L, A/R, A/P, Payroll, Inventory, and Job Cost), D-base II, SuperCalc II, Vector Connect, and Vector Memorite II. The entire system is in perfect working condition and has been under maintenance contract since purchase in 1983. I will consider offers for individual pieces of the equipment or software. Alec

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Dryden, (615) 256-7620, c/o Southeast Service Corporation, 322 Fourth Avenue South, Nashville TN 37201.

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FOR SALE: Two VSX-3000 Vector Graphic computers, each including the following: 256K additional RAM, 10 Mbyte hard disk, 714 Kbyte floppy drive, Mindless Terminal, LINC Saber-net board. Software includes VSX LINC 3.0 Operating System, SX CP/M-86 Operating System, SX CP/M-86 Programmer Disk, Connect Ver 2.0 Rel 2 communications program, Execuplan II Ver 2.3 Rel 7 spreadsheet program, Accuchart Ver 1.3 Rel 1 chart software, Memorite III (F) Ver 3.1 rel 2, Magbase3 database software, and SX MS-DOS 2.11 (Type A1) Operating System. Price for everything is \$10,000 (or best offer). Bruce Powell, (818) 986-4727, Wilkins Randles Associates, 16255 Ventura Blvd., Suite 300, Encino CA, 91436.

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FOR SALE: Four Vector Graphic IV, Model 30 computers, one NEC 7715 printer. Best reasonable offer. Craig Kiernan, CPA, 9401 Reseda Blvd., Northridge CA 91314-2986. Phone (818) 701-7277.

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FOR SALE: Al Brandli and Associates (ABA) sent in a large list of products which will be of interest to Vector Users, and to some extent, such as the software, to Micropolis users. Al reminds us that 1985 purchases may qualify for a 10% Investment Tax Credit and accelerated depreciation that may not be available in 1986 (referencing both President Reagan's tax proposal in May, and the current plan by the House Ways and Means Committee). ABA offers trade-ins on your old hardware, and a bi-monthly newsletter if you call or write and request it. For information on any of the following, contact Al at (714) 754-6363, 3176 Pullman St., Suite 103, Costa Mesa CA 92626.

Just as a matter of interest, not necessarily a recommendation, members leary of mail/phone order purchases can note that I bought one of Al's 5010E systems. The exchange of several thousand dollars and two large boxes of hardware was made with both of us happy. The system worked when plugged in. The one operating procedure question I had was answered with a phone call.

Soft-sectored, New Vectors

Al is offering members of the MUG 20% (30% on the 36Mb VSX-5000 and VMX-5000) off the retail prices of the new Vector computers listed below. All computers contain 640K of RAM. You must place orders by 11/25/85.

Single-User

VSX-2000 (2 floppies)	4,295
VSX-2500 (1 F, 5Mb)	4,995
VSX-3000 (1 F, 10Mb)	5,995
VSX-4500 (1 F, 28Mb)	7,295
VSX-5000 (1 F, 36Mb)	9,995
VSX-8000 (1 F, 112Mb)	16,995

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Multi-User	(2 user)	(3 user)	(4 user)
VMX-2500 (5Mb)	7,380	8,225	9,520
VMX-3000 (10Mb)	8,680	9,525	10,820
VMX-4500 (28Mb)	10,380	11,225	12,520
VMX-5000 (36Mb)	10,980	11,825	13,120
VMX-8000 (112Mb)	19,380	20,225	21,520

Software ('till 12/15/85)

Product	ABA Price	List Price	Product	ABA Price	List Price
MS-DOS 2.1 O.S.	70	95	(Microsoft)		
LINC 3.0 O.S.	150	300	BASIC Compiler, 8-bit	195	295
DataManagr 2.0	250	400	FORTTRAN, 8-bit	295	360
Vector Memorite III	225	400	GW BASIC 2.0 Inter.	145	250
ExecuPlan II	95	175	MS-DOS 2.0 Macro Assem	145	195
Forecasting Exec.	195	295			
Milestone	195	275	(Quest Software)		
Vector DateMaster	95	295	Peachtree 8 Series	1700	3000
BIS-3780	395	550	The BOSS Financial	895	1295
BIS-3270	395	550	Time and Billing	495	695
ACCULINK	125	195	T.I.M. III	250	395
MailLINK 1.0/2.0	395	595	Marketfax	250	495
SCOPE 2 CP/M	145	195	MicroPlan	350	495
SCOPE 2 MS-DOS	145	195	ProfitPlan	145	195
			PlanFin	145	195
(Digital Research)			ProFin	195	295
C Language	245	350	Financial Analyzer	145	200
CBASIC-86	245	325	DocuPlan	245	295
Pascal/MT+86	345	500	MemoPlan	145	200
Personal BASIC	125	150	The Firm Solution	1250	2500
PL/I-86	495	650	Alert Docket	250	500
CIS-COBOL-86	650	850	GraphPlan	245	295
LEVEL II COBOL-86	1200	1600	Crop Management Sys.	395	549
Access Manager-86	295	395			
Display Manager-86	345	450			
Assembler Plus Tools	145	200			

Inventory Clearance ('till 12/15/85)

Refer to pages 8-10 of the October newsletter (#63). Only the 32Mb 5032E multi-user systems, and extra terminals, remain from the items on page 8. The prices remain the same, \$2995 & 495. Many of the items on pages 9 & 10 are still available. However, MUG members can take an additional 10% off the following listed prices.

Hard Disk Upgrades ('till 12/15/85)

Refer to page 9 of the September (#62) newsletter. All the items listed are still available. In addition, a 36Mb upgrade to the Vector 4 is available for \$3,500. However, MUG members can take 20% off all the listed prices.

CHRISTMAS SUGGESTIONS

by Lynn Rudow

Honey, What do you want for Christmas?

Don't most of us grown-ups hate that question? It forces us to try to come up with an answer. Hardware? Software? Read on for some good ideas.

Since I've already gotten my answer from Buzz, thought I'd help out the other spouses. Oh, Buzz wants a laser printer or lap computer. Not that the nine computers and five printers we have don't work - they do. He just wants this new stuff. What can I say - it's Christmas.

1015 DRIVES

Anyway, I've got a bunch of 1015-II drives which we purchased at a Vector Graphic auction, at a considerable savings. Since a lot of you have Vectors, maybe you'd like to have a back-up, or add-on, to your current system.

These drives aren't new, "hot off the assembly line". They had been on a shelf at Vector Graphic. Vector Graphic moved to a smaller location and had no room for them. Thus the auction.

We do inspect these drives physically and run tests. The diagnostic disk is run on all drives. We check for disk insertion/engagement, do a DISKCOPY of a "standard" disk, load basic from low disk tracks, load an application from high tracks, and check for noise. We also have a 30-day money-back guarantee. The only prohibition is that no disassembly of the drive is made and you pay shipping.

The cost is \$150 for a bare drive or \$200 with cabinet and power supply, check or money order. Visa/Master card is slightly higher. This price does not include shipping.

CP/M SOFTWARE

If you're not into hardware, how about software. Some of you may not be aware of the amount of software available to you. A lot of software vendors can't supply the product in 16-sector format. Well, I can take care of that. If you buy from me, I can download it for you. Take a look below at all the software you can run!

As you can see, there is a lot of software, and 95% of it we know very little about. There are some packages we can give you technical support on - and we will, but there is a lot more that we would not be able to support. If you are interested in a particular package give me a call. Again, prices do not include shipping and Visa/Master card is slightly higher.

As we've mentioned many times, we do use, love, and recommend the Spellbinder wordprocessor program. The utility programs POWER and CATALOG are used frequently. Of special note is the temporarily reduced price of Datasmith's BOOKKEEPING. Normally it's \$238. Through December, it's \$150. BOOKKEEPING is available for CP/M or MDOS. We've used it every month for four years. (Actually, Buzz is using a BASIC/Z on CP/M translation of the MDOS version. I can throw that in for you, if you're interested.)

ADVANCED MICRO TECHNIQUES	
dpatch	\$ 157
microlib	212

AMERICAN TRAINING INT'L INC	
teach yourself cp/m	40
teach yourself dbase II	75
teach yourself mbasic	40
teach yourself microplan	75
teach yourself multiplan	75
teach yourself supercalc	75
teach yourself wordstar	75

ARTIFICIAL INTELLIGENCE	
pas-3 series 2 dental	,997
pas-3 series 2 medical	997

BORLAND INTERNATIONAL	
turbo pascal 3.0	70
turbo toolbox	55
turbo tutor	35
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BPI SYSTEMS INC	
accounts receivable	407
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BUSINESS SOFTWARE	
planfin	167
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BYROM SOFTWARE	
bstam	170
bstms	170

CHAMPION SOFTWARE	
accounts payable	300
accounts receivable	300
the champion	
(ap,ar,gl,inv,pr)	1337
general ledger	300
inventory	300
payroll	300

CHANG LABS	
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memoplan	167
microplan	347

COMPUTER ASSOCIATES	
super spellguard	50
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supercalc II	227
superwriter	227

COMPUTING	
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power menu	140
docupower	140

CONDOR COMPUTER CORP	
condor I	227
condor III	440

DAMAN	
cp/m 2.2	260

DATASMITH	
bookkeeping	150

DIGITAL MARKETING	
datebook	140
milestone	200

DIGITAL RESEARCH	
access manager	230
cbasic	140
cbasic compiler	350
display manager	290
dr assembler plus tools	170
gsx-80	75
pascal/mt	260
pl/I-80	380
speedprogramming pkg	170

DJR ASSOCIATES	
fms-80	250

FAIRCOM	
micro b+ for cbasic	220
micro b+ for mbasic	220

FINANCIAL PLANNING ASSOC	
mini model	350

FOX & GELLER ASSOC	
dgraph	220
dutil	99
quickcode	227
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quickscreen for fms-80	139
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IMSI	
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INFOCOM (games)	
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MICRO BUSINESS APPLICATIONS	
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accounts receivable w/invoicing	407
fixed asset accounting	287
gen ledger w/financ report writer	407
inventory control w/invoicing	407
payroll w/checkwriting	407

MICROCOMP CIVIC ENGINEERING S/W	
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pipe network analysis	420

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wordstar professional	350

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statpak	347

OASIS	
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word plus	140

OPEN SYSTEMS INC	
business basic interpreter	200
* accounts payable	432
* accounts receivable	432
* general ledger	432
* inventory	432
* job cost	432
* materials management	432
* payroll	432
* purchase order	432
* report writer	432
* sales order	432
* Must have Bus Basic Interpreter.	

PALANTIR SOFTWARE	
palantir	200

PARADIGM	
miniledger	130
acct pay/acct rec	75
acct pay	50
acct rec	50
mini invent	50

PEACHTREE SOFTWARE	
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PEARLSOFT	
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REALWORLD CORP	
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rm/cobol full dev sys	500
rm/cobol runtime	200

SCIENTIFIC MARKETING	
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SOFTWARE RESEARCH TECHNOLOGY	
smartkey II	50

SRX SYSTEMS	
catalog	75

STAR SOFTWARE SYSTEMS	
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legal timekpg, billg & acctg	667
property management	667

STATCOM		SUPERSOFT (cont.)	
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crt form for fortran-80	290	forth z-80	170
crt form for mbasic	290	fortran	245
crt form for pascal/mt+	290	macro I	80
crt form for pl/I-80	290	ratfor	100
-----		scratchpad	167
STRUCTURED SYSTEMS GROUP		star-edit	185
magic worksheet	227	stats-graph	170
-----		tiny pascal	100
SUCCESS MANAGEMENT CONSULTANTS		utilities I	60
model 1040 tax planning pgm	157	utilities II	60
-----		z8000 assembler	350
SUPERSOFT		-----	
"a"	230	SYSTEM/Z	
c compiler	260	basic/z	227
data-view	170	-----	
diagnostics II	125	TECHNE SOFTWARE CORP	
disk doctor	100	cache/q	185
disk-edit	100	-----	
encode/decode II	100	WOOLF SOFTWARE SYSTEMS	
		move-it	125

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* For Assistance with general information, MUG/Vector Graphic, DAMAN hardware *

* & software, Micropolis Basic, Basic/z, Micropolis drives & Micropolis parts-*

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* Call Lynn at (205)881-1697 during the Central Times of 9 AM to 5 PM. Buzz *

* is sometimes around in the evening (Lynn will know) and from 9 - 12 on Sat. *

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